REMARKS

Claims 1-10 and 12 stand rejected, with claim 11 objected to in the outstanding Official Action. Claim 8 has been cancelled without prejudice, claims 1, 2, 5, 6 and 10-12 amended and therefore claims 1-7 and 9-12 are the only claims remaining in this application.

Attached hereto is a marked-up version of the changes made to the specification and claim(s) by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

The Examiner's acknowledgment of applicants' claim for priority and receipt of the certified copy of the priority document is very much appreciated. Additionally, the Examiner's consideration of the prior art submitted by applicants with the PTO Form-1449 having been considered on February 19, 2002, is also very much appreciated.

The Examiner's notation with respect to consideration of the references disclosed in applicants' specification is appreciated. Applicants note that the disclosure does meet the requirements of Rule 56, but does not necessarily supply patent copies such that the Examiner would be obligated to consider each of the references. At present, the undersigned has no reason to believe that these references are any more pertinent than the prior art already of record and cited by the Examiner, but a further review of the references will be undertaken and should they be more pertinent, a formal Information Disclosure Statement submitting copies of the references will be submitted.

The Patent Office objects to the Abstract and the arrangement of the specification. It is also appreciated that the Examiner has brought the Abstract and the arrangement of

the specification to the applicant's attention. It is noted that the objection to the Abstract and the arrangement appears to be an indication that the originally filed specification (transmitted from WIPO) do not meet the formality requirements of the U.S. Patent and Trademark Office. The Patent Office is reminded that the U.S. Patent and Trademark Office must comply with all articles of the Patent Cooperation Treaty (PCT) including Article 27. It has been held that:

"if the rule and interpretation of the PTO conflicts with the PCT, it runs afoul of Article 27 of the PCT which provides in part:

(1) No national law shall require compliance with requirements relating to the form or contents of the international application different from or additional to those which are provided for in this Treaty and the Regulations." Caterpillar Tractor v. Commissioner, 231 USPQ 590, 591 (EDVA 1986).

The Patent Office has referenced this decision in the Official Gazette dated September 9, 1986 (1070 TMOG 5).

As a consequence, the Patent Office (including the Chief Draftsman's Office) may not require Abstract changes or specification format changes as long as the originally submitted documents comply with the PCT requirements. Inasmuch as this specification and these drawings were forwarded for WIPO, by definition, they meet the PCT requirements (they are not forwarded until they meet PCT requirements.). Therefore, the objection to the Abstract and the arrangement of the specification is respectfully traversed and reconsideration thereof is respectfully requested.

Notwithstanding the above, applicant has included a retyped Abstract on a separate sheet, and has added headings and subheadings to the specification.

In response to the objection to the title, applicants have amended the title of the application to read "Optical Waveguide and Fabrication Method." However, if the Examiner has in mind a more appropriate title, applicants will certainly entertain any suitable alternative.

In section 5 of the Official Action, the Examiner objects to the numbering of pages in the application. Applicants is uncertain as to the basis for this rejection, as this is a PCT national phase entry and as such any proper PCT format must be accepted by the U.S. Patent and Trademark Office. If the Examiner will elaborate as to the basis of the objection, applicants will endeavor to amend the application in an appropriate manner.

Claims 6, 8 and 11 have various objections noted. Specifically, with respect to claim 6, the Examiner alleges that the term "indiffusion" is a "made up term" and is unnecessary. Applicants would note that this is not a "made up" term, and indiffusion is a term commonly used by those of ordinary skill in the art in the discussion of the creation of semiconductor materials.

Applicants attach hereto a copy of a paper by Zhifang Fan et al, published in March 1996 by the American Institute of Physics, and the Examiner's attention is directed to the last page, first column, in which the terms "outdiffusion" and "indiffusion" are used. Clearly these are well-known terms of art to those of ordinary skill in the art, and thus the use of those terms in claim 6 is believed to be appropriate.

The Examiner's objection to claim 8 is well taken, and applicants have not only cancelled claim 8, but in the portion of claim 8 incorporated into amended claim 1, has

deleted the reference numbers to thereby obviate any future confusion with respect to the use of such numbers.

The Examiner's objection to the format of claim 11 is noted, and claim 11 has been rewritten in more correct U.S. format.

In view of the above argument, cancellation and amendment, it is submitted that the remaining claims are in proper form for allowance.

Claims 1-10 and 12 stand rejected under 35 USC §112 (second paragraph) as being indefinite. The Examiner objects to the phrase "modified optical properties" as being vague in Claim 1. However, this is only a portion of the phrase, and the complete phrase read "regions of the guiding lamina have modified optical properties so as to define a light guiding path along the guiding lamina." Thus, applicants were defining a light guiding path along the lamina so as to encompass the optical properties, and the Examiner correctly interpreted the phrase as being anything that defines "a light guide path." However, in applicants' amended claim 1, this language has been modified somewhat to avoid the vagueness concerning the Examiner and reconsideration of the amended claim is respectfully requested.

Claim 5 adds the limitation to claim 4 that the modified regions are spatially, periodically, electrically poled regions of the guiding lamina. The creation and use of "poled regions" is a well-known process to provide a spatially periodic change in the properties of a material. This is discussed in the two paragraphs beginning on page 4, line 4, and continuing to line 19 of the present specification and is also shown in applicants' Figure 1. Again, the Examiner's interpretation is correct if the Examiner

means "intermittent" in the spatial sense. However, applicants have also amended claim 5 to recite that the regions are "periodically" rather than merely "periodical."

The Examiner also objects to the language of claim 10 as not understanding the phrase "to reduce components at the wavelength." Applicants have amended claim 10 to recite reducing "component having the wavelength of the input optical signal." This then clarifies the operation, although applicants would note that the Examiner has again correctly deduced the structure intended in the claim.

Claim 12 also indicated as being indefinite with respect to the phrase "modify regions." Applicants agree that this provides some confusion and have deleted this language in claim 12.

In accordance with the above amendments, claims 1-10 and 12 are believed to meet all the requirements of 35 USC §112 (second paragraph) and any further objection thereto is respectfully traversed.

On page 9 of the Official Action, in sections 16, 17 and 18, the Examiner has noted that claim 8 contains allowable subject matter, claim 11 is allowed and claim 12 contains allowable subject matter. The subject matter of claim 8 has been incorporated into independent claim 1, and therefore claim 1 and claims dependent directly or indirectly therefrom, i.e. claims 2-7, 9 and 10, are believed to be in condition for allowance. The allowance of claim 11 is very much appreciated, and the amendment to claim 12 is believed to overcome the indefiniteness as noted above. As a result, claims 11 and 12 are believed in condition for allowance. The Examiner's indication of the allowable subject matter is very much appreciated.

In view of the fact that claims 1-7 and 9-12 are believed to be in condition for allowance and are the only claims remaining in this application, the previous rejections of claims under prior art references has been mooted and need not be responded to.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-7 and 9-12 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of these claims, he is respectfully requested to contact applicant's undersigned representative.

Respectfully submitted,

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Enclosure:
Zhifang Fan et al, Appl. Phys. Lett. 68, No. 12

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE

OPTICAL WAVEGUIDE AND FABRICATION METHOD

[FABRICATION OF OPTICAL WAVEGUIDES]

IN THE SPECIFICATION

Page 1, between the Title and first paragraph:

BACKGROUND OF THE INVENTION

1. Field of the Invention

Page 1, below the first paragraph:

2. Discussion of Prior Art

Page 1, above the paragraph beginning at line 26:

SUMMARY OF THE INVENTION

Page 3, above the paragraph beginning at line 20:

BRIEF DESCRIPTION OF THE DRAWINGS

Page 3, below the last line:

DETAILED DISCUSSION OF EMBODIMENTS

IN THE CLAIMS

1. *(Amended)* An optical waveguide comprising:

[at least] a guiding lamina [(10)] of optical material bonded by direct interfacial bonding to a superstructure lamina [(20)] of optical material, [in which] and

a second superstructure lamina bonded by direct interfacial bonding to the guiding lamina, [regions of] the guiding lamina [have modified optical properties so as to define] defining a light guiding path [along the guiding lamina (10) characterised in that the waveguide further comprises a second superstructure lamina (20) bonded by direct interfacial bonding to the guiding lamina], wherein said path is formed of an unmodified optical region of the guiding lamina and a modified optical region defines a boundary of said path.

2. *(Amended)* A waveguide according to claim 1, in which the guiding lamina [(10)] is formed of a ferroelectric material.

3. *(Amended)* A waveguide according to claim 2, in which the guiding lamina is formed of lithium niobate.

4. *(Amended)* A waveguide according to claim 2, in which the modified regions are electrically poled regions of the guiding lamina.

5. *(Amended)* A waveguide according to claim 4, in which the modified regions are spatially [periodical] periodically electrically poled regions of the guiding lamina.

6. *(Amended)* A waveguide according to claim 1, in which the modified regions [(130, 150)] are formed by indiffusion of one or more dopant materials into the guiding lamina.

7. *(Amended)* A waveguide according to claim 1, in which at least part of the modified regions form the light-guiding path.

9. *(Amended)* An optical parametric device comprising:

a waveguide according to claim 1; and

means for launching an input optical signal into the waveguide.

10. *(Amended)* A device according to claim 9, comprising:

an output filter for filtering light emerging from the waveguide to reduce components [at] having the wavelength of the input optical signal.

11. *(Amended)* A method of fabricating an optical waveguide, the method comprising the steps of:

(a) bonding, by direct interfacial bonding, a guiding lamina (10) of optical material to a superstructure lamina [(20)] of optical material; [and]

(b) modifying optical properties of regions [(130, 150)] of the guiding lamina so as to define a light guiding path along the guiding lamina[, characterised in that the method further comprises the steps of:];

(c) [after steps (a) and (b),] removing material from the guiding lamina to reduce the thickness of the guiding lamina [(10)]; and

(d) [after step (c),] bonding, by direct interfacial bonding, a further superstructure lamina [(20)] to the guiding lamina.

12. *(Amended)* A method according to claim 11, further comprising:

[(e)] before step (a), indiffusing and/or out-diffusing material to/from one face of the guiding lamina[to modify regions of the guiding lamina], that face being bonded to the superstructure lamina in step (a); and

[(f)] before step (d), indiffusing and/or out-diffusing material to/from the exposed face of the guiding lamina[to modify regions of the guiding lamina], that face being bonded to the further superstructure lamina in step (d).